

University of Houston Master Specification

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SECTION 04 4313 - ANCHORED STONE MASONRY VENEER

Maintain Section format, including the UH master spec designation and version date in bold in the center columns of the header and footer. Complete the header and footer with Project information.

Edit and finalize this Section, where prompted by Editor's notes, to suit Project specific requirements. Make selections for the Project at text identified in bold.

This Section uses the term "Architect" or "Engineer." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

Delete hidden text after this Section has been edited for the Project.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:
 - 1. The current version of the *Uniform General Conditions for Construction Contracts*, State of Texas, available on the web site of the Texas Facilities Commission.
 - 2. The University of Houston's *Supplemental General Conditions and Special Conditions for Construction*.

1.2 SUMMARY

- A. Section Includes:
 - 1. Stone masonry anchored to concrete backup.
 - 2. Stone masonry anchored to unit masonry backup.
 - 3. Stone masonry anchored to cold-formed metal framing and sheathing.

1.3 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.

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1.4 ACTION SUBMITTALS

- A. Product Data: For each variety of stone, stone accessory, and manufactured product.

Retain paragraph and associated subparagraphs below if Project is to be LEED v4 certified.

- B. LEED Submittals (Projects Authorized for LEED certification only):

1. Building Product Disclosure and Optimization - Sourcing of Raw Materials:

- a. Leadership Extraction Practices

- 1) Extended Producer Responsibility (EPR): Submit documentation indicating that manufacturers have a take back or recycling program for the product purchased.
- 2) Recycled Content: For products having recycled content, indicate percentages by weight of post-consumer and pre-consumer recycled content.

- a) Include statement indicating costs for each product having recycled content.

- b. Sourcing of Raw Materials: For products that are required to comply with requirements for regional materials, indicate location of material manufacturer and point of extraction, harvest, or recovery for each raw material.

- 1) Include statement indicating distance to Project, cost for each regional material and the fraction by weight that is considered regional

- 2) Product Certificates: For materials manufactured within 100 miles of Project, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each raw material

2. Laboratory Test Reports: For installation adhesives, indicating compliance with requirements for low-emitting materials.

- C. Samples for Initial Selection: For colored mortar and other items involving color selection.

- D. Samples for Verification:

1. For each stone type indicated. Include at least two Samples in each set and show the full range of color and other visual characteristics in completed Work.
2. For each color of mortar required. Label Samples to indicate types and amounts of pigments used.

- E. Shop Drawings: Show fabrication and installation details for stone. Include dimensions, details of reinforcement and anchorages, if any, and indication of finished faces.

1. Include building elevations showing layout of stone and locations of joints and anchors.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

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- B. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, supply sources, and other information as required to identify materials used. Include mix proportions for mortar and source of aggregates.
1. Neither receipt of list nor approval of mockups constitutes approval of deviations from the Contract Documents contained in mockups unless Architect approves such deviations in writing.
- C. Material Test Reports:
1. Stone Test Reports: For each stone variety proposed for use on Project, by a qualified testing agency, indicating compliance with required physical properties, other than abrasion resistance, according to referenced ASTM standards. Base reports on testing done within previous three years.
 2. Sealant Compatibility and Adhesion Test Report: From sealant manufacturer indicating that sealants will not stain or damage stone. Include interpretation of test results and recommendations for primers and substrate preparation needed for adhesion.

Retain paragraph and associated subparagraphs below if Project is to be LEED v4 certified.

- D. LEED Informational Submittals:
3. Building Product Disclosure and Optimization - Sourcing of Raw Materials:
 - a. Raw Material Sources and Extraction Reporting: Submit raw materials supplier corporate Sustainability Reports (CSRs); documenting responsible extraction; including extraction locations, long term ecologically responsible land use, commitment to reducing environmental harms from extraction and manufacturing processes, and a commitment to meeting applicable standards or programs that address responsible sourcing criteria.
 - 1) Submit manufacturers' self-declared reports.
 - 2) Submit third party verified corporate sustainability reports (CSR) using one of the following frameworks:
 - a) Global Reporting Initiative (GRI) Sustainability Report
 - b) Organization for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises
 - c) UN Global Compact
 - d) ISO 26000
 - e) USGBC approved program.
 4. Building Product Disclosure and Optimization - Material Ingredients
 - a. Material Ingredient Optimization: Submit manufacturer's Environmental Product Declaration (EPD) or at least one of the following:
 - 1) GreenScreen V1.2 Benchmark: Third party report prepared by a licensed GreenScreen List Translator, or a full GreenScreen Assessment.

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- 2) Cradle to Cradle: Manufacturer's published literature for the product bearing the Cradle to Cradle logo.
 - 3) International Alternative Compliance Path - REACH Optimization
 - 4) Declare: Manufacturer's completed Product Declaration Form
 - 5) Other programs approved by USGBC
- b. Product Manufacturer Supply Chain Optimization: Submit documentation from manufacturers for products that go beyond material ingredient optimization as follows:
- 1) Are sourced from product manufacturers who engage in validated and robust safety, health, hazard, and risk programs which at a minimum document at least 99 percent (by weight) of the ingredients used to make the building product or building material, and
 - 2) Are sourced from product manufacturers with independent third party verification of their supply chain that at a minimum verifies:
 - a) Processes are in place to communicate and transparently prioritize chemical ingredients along the supply chain according to available hazard, exposure and use information to identify those that require more detailed evaluation
 - b) Processes are in place to identify, document, and communicate information on health, safety and environmental characteristics of chemical ingredients
 - c) Processes are in place to implement measures to manage the health, safety and environmental hazard and risk of chemical ingredients
 - d) Processes are in place to optimize health, safety and environmental impacts when designing and improving chemical ingredients
 - e) Processes are in place to communicate, receive and evaluate chemical ingredient safety and stewardship information along the supply chain
 - f) Safety and stewardship information about the chemical ingredients is publicly available from all points along the supply chain.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs experienced stonemasons and stone fitters.
- B. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution. Comply with requirements in Section 01 4000 "Quality Requirements" for mockups.
1. Build mockup of typical wall area as shown on Drawings.
 2. Build mockups for typical exterior wall in sizes approximately 48 inches (1200 mm) long by 48 inches (1200 mm) high by full thickness, or in a size as otherwise indicated on the Drawings, including face and backup wythes and accessories.

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- a. Include stone coping at top of mockup.
 - b. Include a sealant-filled joint at least 16 inches (400 mm) long in mockup.
 - c. Include through-wall flashing installed for a 24-inch (600-mm) length in corner of mockup approximately 16 inches (400 mm) down from top of mockup, with a 12-inch (300-mm) length of flashing left exposed to view (omit stone masonry above half of flashing).
 - d. Include concrete or unit masonry or metal stud backup, sheathing, membrane air barrier, insulation, veneer anchors, flashing, and weep holes in exterior masonry-veneer wall mockup.
3. Protect accepted mockups from the elements with weather-resistant membrane.
 4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- B. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- C. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store pre-blended, dry mortar mix in delivery containers on elevated platforms, under cover, in a dry location, or in covered weatherproof dispensing silos.
- D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 FIELD CONDITIONS

- A. Protection of Stone Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed stone masonry when construction is not in progress.
 1. Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely in place.
- B. Stain Prevention: Immediately remove mortar and soil to prevent them from staining stone masonry face.
 1. Protect base of walls from rain-splashed mud and mortar splatter using coverings spread on the ground and over the wall surface.
 2. Protect sills, ledges, and projections from mortar droppings.

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3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 4. Turn scaffold boards near the wall on edge at end of each day to prevent rain from splashing mortar and dirt on completed stone masonry.
- C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace stone masonry damaged by frost or freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1.9 COORDINATION

- A. Advise installers of other work about specific requirements for placement of reinforcement, veneer anchors, flashing, and similar items to be built into stone masonry.
- B. Where applicable, coordinate locations of dovetail slots in concrete that are to receive stone anchors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Stone: Obtain stone, regardless of finish, from single quarry with resources to provide materials of consistent quality in appearance and physical properties.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of uniform quality for each cementitious component from single manufacturer and each aggregate from single source or producer.

2.2 LIMESTONE

- A. Material Standard: Comply with ASTM C 568.
 1. Classification: II Medium Density
 2. Properties
 - a. Minimum modulus of rupture of 700 pounds per square inch

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- b. Coefficient of thermal expansion: 0.000003 inch/inch-degree F maximum.
 - c. Ultimate shear strength: 900 pounds per square inch minimum.
 - d. Stone thickness: <insert thickness> inches.
3. [Select] [Standard] grade based on ILI Handbook.
- B. Regional Materials: Stone shall be fabricated within 500 miles (800 km) of Project site from stone that has been extracted within 500 miles (800 km) of Project site.

Select one or both stone varieties in Paragraph below

- C. Varieties and Sources: Subject to compliance with requirements, provide the following:
1. Texas "Cordova" Cream Limestone, detailed as recommended by the Indiana Limestone Handbook.
 2. Texas "Cordova" Shell Limestone, detailed as recommended by the Indiana Limestone Handbook.

2.3 MORTAR MATERIALS

- A. Regional Materials: Aggregate for mortar and grout, cement, and lime shall be extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.
- B. Portland Cement: ASTM C 150, Type I or Type II, except Type III may be used for cold-weather construction; natural color or white cement may be used as required to produce mortar color indicated.
1. Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C 114.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Portland Cement-Lime Mix: Packaged blend of Portland cement and hydrated lime containing no other ingredients.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Essroc, Italcementi Group: Saylor's Plus.
 - b. Holcim (US) Inc.: Rainbow Mortamix Custom Color Cement/Lime.
 - c. Lafarge North America Inc.: Eaglebond.
 - d. Lehigh Cement Company: Lehigh Custom Color Portland/Lime Cement.
 - e. Mutual Materials Co.: DesignMix Mortar Mix.
 - f. Substitutions: See Section 01 2500 "Substitution Procedures."

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- E. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in stone masonry mortar. Pigments shall not exceed 10 percent of Portland cement by weight.
 - 1. Products: Subject to compliance with requirements, provide one of the following :
 - a. Davis Colors: True Tone Mortar Colors.
 - b. Lanxess Corporation: Bayferrox Iron Oxide Pigments.
 - c. Solomon Colors: SGS Mortar Colors.
 - d. Substitutions: See Division 01 Section "Substitution Procedures."
- F. Aggregate: ASTM C 144 and as follows:
 - 1. For pointing mortar, use aggregate graded with 100 percent passing No. 16 (1.18-mm) sieve.
 - 2. White Aggregates: Natural white sand or ground white stone.
 - 3. Colored Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.
 - a. Match Architect's sample.
- G. Water: Potable and clean.

2.4 ACCESSORIES

- A. Horizontal Joint Reinforcement: As specified in Section 04 2000 "Unit Masonry."
- B. Other Anchors in Direct Contact with Stone: ASTM A 666, Type 304, stainless steel, of sizes and configurations required for support of stone and applicable superimposed loads.
- C. Weep/Cavity Vents: Molded PVC grille, insect resistant.
- D. Refer to Section 04 2000 "Unit Masonry" for flashing, cavity drainage material, and other masonry accessories.

2.5 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar and grout stains, efflorescence, and other new construction stains from stone masonry surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by cleaner manufacturer and stone producer.
- B. Cleaning Solutions:

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1. Do not use products containing hydrochloric (muriatic) acid, hydrofluoric acid, or ammonium bi-fluoride.
2. For removing localized ferrous staining: Use oxalic acid or phosphoric acid; mix one part acid with ten parts water by volume. Higher concentrations may be used for local application.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
 - a. Diedrich Technologies, Inc.
 - b. Dominion Restoration Products.
 - c. EaCo Chem, Inc.
 - d. Hydrochemical Techniques, Inc.
 - e. Prosoco, Inc.
 - f. Substitutions: See Section 01 2500 "Substitution Procedures."

2.6 FABRICATION

- A. General: Fabricate stone units in thicknesses, sizes and shapes required to comply with requirements indicated.
 1. For limestone, comply with recommendations in ILI's "Indiana Limestone Handbook."
- B. Select stone to produce pieces of thickness, size, and shape indicated, including details on Drawings.
- C. Dress joints (bed and vertical) straight and at right angle to face unless otherwise indicated. Shape beds to fit supports.
- D. Cut and drill sinkages and holes in stone for anchors and supports.
- E. Carefully inspect stone at quarry or fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units before shipment.
 1. Clean sawed backs of stone to remove rust stains and iron particles.
- F. Finish exposed stone faces and edges to comply with requirements indicated for finish and to match approved samples and mockups.
 1. Finish: Machine smooth (lightly honed, 80 grit) finish on exposed sides, sawn finish on other sides.

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2.7 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride
 - 2. Use Portland cement-lime mortar unless otherwise indicated.
 - 3. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding water. Then mix again, adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for one to two hours. Add remaining water in small portions until mortar reaches required consistency. Use mortar within 2-1/2 hours of final mixing; do not re-temper pigmented mortar or use partially hardened material.
- B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Stone Masonry: Comply with ASTM C 270, Proportion Specification.
 - 1. Mortar for Setting Stone: Type N.
- D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
 - 1. Pigments shall not exceed 10 percent of Portland cement by weight. If using pigments containing carbon black, limit pigments to 2 percent of Portland cement by weight.
- E. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary.
 - 1. Mix to match Architect's sample.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces indicated to receive stone masonry, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stone masonry.
- B. Examine substrate to verify that dovetail slots, inserts, reinforcement, veneer anchors, flashing, and other items installed in substrates and required for or extending into stone masonry are correctly installed.

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- C. Examine wall framing, sheathing, and weather-resistant barrier to verify that stud locations are suitable for spacing of veneer anchors and that installation will result in a weatherproof covering.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Accurately mark stud centerlines on face of weather-resistant barrier before beginning stone installation.
- B. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.3 SETTING OF STONE MASONRY, GENERAL

- A. Perform necessary field cutting and trimming as stone is set.
 - 1. Use power saws to cut stone that is fabricated with saw-cut surfaces. Cut lines straight and true, with edges eased slightly to prevent snipping.
 - 2. Use hammer and chisel to split stone that is fabricated with split surfaces. Make edges straight and true, matching similar surfaces that were shop or quarry fabricated.
- B. Install supports, fasteners, and other attachments indicated or necessary to secure stone masonry.
- C. Set stone accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances. Units should be set on shims if they are stacked.
- D. Install steel lintels where indicated. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.
- E. Maintain uniform joint widths except for variations due to different stone sizes and where minor variations are required to maintain bond alignment if any. Lay walls with joints not less than 1/4 inch at narrowest points or more than 5/8 inch at widest points.
- F. Provide sealant joints of widths and at locations indicated in the Drawings.
 - 1. Keep sealant joints free of mortar and other rigid materials.
 - 2. Sealant joints are specified in Section 07 9200 "Joint Sealants."
- G. Install metal expansion strips in sealant joints at locations indicated. Build flanges of expansion strips into masonry by embedding in mortar between stone masonry and backup wythe. Lap

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each joint 4 inches (100 mm) in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.

- H. Install embedded flashing and weep holes at shelf angles, lintels, ledges, and other obstructions to downward flow of water in wall, and where indicated.
 - 1. As indicated on Drawings.
 - 2. Install metal drip edges beneath flexible flashing at exterior wall face. Stop flexible flashing 1/2 inch (13 mm) back from exterior wall face. Overlap and adhere flexible flashing to top of metal drip edge.
- I. Place weep holes and vents in joints where moisture may accumulate, including at base of cavity walls, above shelf angles, and at flashing.
 - 1. Space weeps 16 inches (400 mm) on center.
 - 2. Place cavity drainage material to comply with configuration requirements for cavity drainage material.

3.4 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (10 mm in 6 m), or 1/2 inch in 40 feet (13 mm in 12 m) or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet (6 mm in 6 m) or 1/2 inch in 40 feet (13 mm in 12 m) or more.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet (6 mm in 6 m) or 1/2 inch in 40 feet (13 mm in 12 m) or more.
- C. Variation of Linear Building Line: For position shown in plan, do not exceed 1/2 inch in 20 feet (13 mm in 6 m) or 3/4 inch in 40 feet (19 mm in 12 m) or more.
- D. Measure variation from level, plumb, and position shown in plan as a variation of the average plane of each stone face from level, plumb, or dimensioned plane.
- E. Variation in Mortar-Joint Thickness: Do not vary from joint size range indicated.
- F. Variation in Plane between Adjacent Stones: Do not exceed one-half of tolerance specified for thickness of stone.

3.5 INSTALLATION OF ANCHORED STONE MASONRY

Retain this Paragraph for concrete backup:

- A. Anchor stone masonry to concrete with corrugated-metal veneer anchors unless otherwise indicated. Secure anchors by inserting dovetailed ends into dovetail slots in concrete.

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For unit masonry backup, select one of the following three Paragraphs

- B. Anchor stone masonry to unit masonry with corrugated-metal or individual wire veneer anchors unless otherwise indicated. Embed anchors in unit masonry mortar joints or grouted cells at a distance of at least one-half of unit masonry thickness.
- C. Anchor stone masonry to unit masonry with wire anchors unless otherwise indicated. Connect anchors to masonry joint reinforcement with vertical rods inserted through anchors and through eyes of masonry joint reinforcement projecting from unit masonry.
- D. Anchor stone masonry to unit masonry with adjustable, screw-attached veneer anchors unless otherwise indicated. Fasten anchors to unit masonry with two screws.

Retain this Paragraph for stud wall backup:

- E. Anchor stone masonry to stud framing with adjustable, screw-attached veneer anchors unless otherwise indicated. Fasten anchors through sheathing to framing with two screws.
- F. Embed veneer anchors in mortar joints of stone masonry at least halfway, but not less than 1-1/2 inches (38 mm), through stone masonry and with at least a 5/8-inch (16-mm) cover on exterior face.
- G. Space anchors to provide not less than one anchor per 2.67 sq. ft. (0.25 sq. m) of wall area. Install additional anchors within 12 inches (300 mm) of openings, sealant joints, and perimeter at intervals not exceeding 12 inches (300 mm).
- H. Anchor stone trim with stone trim anchors where indicated. Install anchors by fastening to substrate and inserting tabs and dowels into kerfs and holes in stone units. Provide compressible filler in ends of dowel holes and bottoms of kerfs to prevent end bearing of dowels and anchor tabs on stone. Fill remainder of anchor holes and kerfs with mortar.
- I. Set stone in full bed of mortar with full head joints unless otherwise indicated. Build anchors into mortar joints as stone is set. Embed anchors in mid-thickness of joint, with 3/4 inches minimum and 1 3/4 inches maximum cover from exterior face of veneer. Provide 2-inch (50-mm) cavity between stone masonry and backup construction unless otherwise indicated. Keep cavity free of mortar droppings and debris.
 - 1. Slope beds toward cavity to minimize mortar protrusions into cavity.
 - 2. Do not attempt to trowel or remove mortar fins protruding into cavity.
- J. Rake out joints for pointing with mortar to depth of not less than 3/4 inch (19 mm) before setting mortar has hardened. Rake joints to uniform depths with square bottoms and clean sides.

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3.6 POINTING

- A. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply pointing mortar in layers not more than 3/8 inch (10 mm) deep until a uniform depth is formed.
- B. Point stone joints by placing and compacting pointing mortar in layers of not more than 3/8 inch (10 mm) deep. Compact each layer thoroughly and allow to it become thumbprint hard before applying next layer.
- C. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the following joint profile:
 - 1. Joint Profile: <Insert joint profile>.

3.7 ADJUSTING AND CLEANING

- A. Remove and replace stone masonry of the following description:
 - 1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.
 - 2. Defective joints.
 - 3. Stone masonry not matching approved samples and mockups.
 - 4. Stone masonry not complying with other requirements indicated.
- B. Replace in a manner that results in stone masonry matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.
- C. In-Progress Cleaning: Clean stone masonry as work progresses. Remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean stone masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before cleaning stone masonry.
 - 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 - 4. Clean limestone masonry to comply with recommendations in ILI's "Indiana Limestone Handbook."

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3.8 EXCESS MATERIALS AND WASTE

- A. Excess Stone: Stack excess stone where directed by Owner for Owner's use.
- B. Excess Masonry Waste: Remove excess clean masonry waste and other waste, and legally dispose of off Owner's property.

END OF SECTION 04 4313

<Insert A/E Name>

Anchored Stone Masonry Veneer

04 4313 - 15

AE Project #: <Insert Project Number>

UH Master: 08.2020